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Roadside control device for a toll apparatus installed in a motor vehicle

Description

The invention relates to a roadside control device for checking the correct operation of a toll apparatus which is installed in a motor vehicle passing the control device and exhibiting an identifying license plate, the toll apparatus performing a satellite-supported electronic toll deduction.

From EP 0 691 013 B1, the content of disclosure of which is included in the present application, an electronic deduction system is known by means of which utilization charges can be collected from vehicles which move through a predetermined geographic zone or a chargeable road distance (utilization charges = toll). The known system provides that in each motor vehicle, a toll apparatus is installed which has a receiver for the signals of a navigation satellite system such as, e.g., GPS (Global Positioning System) or Glosnar and is provided with an electronic memory in which the chargeable road distances and the geographic zones (in the text which follows, only chargeable roads or road distances are mentioned, to simplify matters) and the respectively associated utilization tariffs are listed. Using the signals of the navigation satellite system, the toll apparatus has access to the current geographic position of

the vehicle at any time and recognizes from the stored data concerning the chargeable road distances whether the motor vehicle is on a chargeable road distance or not and can automatically determine the toll amounts which may be due in this manner. To ensure completely anonymous deduction of the toll amounts, the known system provides for the use of debit cards (e.g. chip card) on which the respectively due toll amounts are deducted by the toll apparatus.

However, this method of collecting the toll amounts, which can be carried out with comparatively little expenditure, in principle opens up a number of possibilities for deception by the operator of the respective vehicle. Suitable precautions for detecting corresponding actions of misuse are therefore mandatory.

From EP 0 701 722 B1, a toll apparatus is known which exhibits for this purpose a device for self monitoring for unauthorized manipulations at the individual components of the toll apparatus and an error memory for recording diagnostic data in the case of an unauthorization manipulation. If an unauthorized manipulation occurs, the toll apparatus can send out a signal indicating the improper operation of the apparatus via a corresponding signal device.

Naturally, this presupposes that the apparatus itself is switched on and that the signal device has not been switched off or otherwise manipulated.

Furthermore, from EP 0 700 561, a toll apparatus is known which has a signal device via which diagnostic data which provide information on the operability of the toll apparatus or of its individual components, respectively, can be interrogated wirelessly from the outside. Using the transmitted diagnostic data, it should be possible to determine both non-payers and wrong payers who pay for their road utilization in a wrong class of charges. This document does not provide more detailed information on the external monitoring devices which are intended to determine and trace the road misuse.

It is, therefore, the object of the present invention to specify a roadside control device for checking the correct operation of a toll apparatus for satellite-supported electronic toll deduction which, on the one hand, ensures a high success rate during the checks to be performed but, on the other hand, requires the least possible expenditure for the apparatus technology and the operation of the control device.

According to the invention, this object is achieved by a control device having the features specified in Claim 1. This control device can be advantageously developed further by means of the features of the dependent subclaims. An advantageous use of the control device according to the invention is specified in Claim 17.